

BUILDING TRUST IN DATA

WHAT'S NEW FOR NATIONAL STATISTICAL SYSTEMS?

BACKGROUND NOTE

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1 CONTEXT: TRUST, STATISTICS AND DIGITALISATION

Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence.

- Arrow, 1972

1.1 TRUTH AND TRUST IN SOCIETY

In 1922, the American journalist Walter Lippmann published a book entitled, "Public Opinion". In its first chapter, he highlights that "pictures inside people's heads do not automatically correspond with the world outside". He writes, "The real environment is altogether too big, too complex, and too fleeting for direct acquaintance. We are not equipped to deal with so much subtlety, so much variety, so many permutations and combinations." (Lippmann, 1965)

We deal with complexity by building a simplified version of reality in our minds, which cannot be challenged easily. We trust our beliefs. Most of what we consider as true or self-evident is, in fact, based on trust. For centuries, modern societies have depended on trust to function. Institutions, including governments, media, and corporations, all command trust. Experts, including official statisticians, command trust. Trust, both in interpersonal relationships and in institutions, is a key ingredient of growth, societal well-being and governance. It is one of the foundations upon which the legitimacy and sustainability of our political systems are built. Modern societies are complex webs of trust relations, relayed via accounts, reports, records, certifications and testimonies.

1.2 STATISTICS - A CONDUIT OF TRUST

Statistics has served as a well-known conduit of trust in our societies, and experts behind it - scientists, economists, mathematicians and statisticians, have a key role as its stewards and custodians. As experts, they command trust and in turn provide numbers that others use to build their beliefs.

Statistical institutions, particularly national statistical offices (NSOs) and supporting international organisations have worked continuously to extend the variety of statistics readily available to inform decision-making. In particular, official statistics influence large numbers of important decisions across government, in the profit and not-for-profit sectors. National and global policy initiatives rely on accurate and quality information. The comparative advantage of official statistics builds on the Fundamental Principles of Official Statistics (UN FPOS), making them a reliable and trusted source of data and information.

Trust matters for national statistical systems (NSS) - the ensemble of statistical organisations and units within a country that jointly collect, process and disseminate official statistics on behalf of national government - primarily because it directly affects the use of their products (official statistics) for decision- and policy-making. This utility ultimately reflects its value to their users: government, private sector, academia, citizens and society at large. Beyond the use of NSS products, trust-related issues also affect the functioning of NSSs in other areas.

For instance, respondents—both individuals and businesses—are sometimes reluctant to share their data due to concerns over privacy or potential misuse.

More importantly, a society that recognises the authority of facts must also establish certain professions and institutions that are beyond the fray of transient politics, sentiment or opinion. Hence, trust in the value of objective statistics also provides a basis for agreement among people – which has implications for societal knowledge and peace.

1.3 DIGITALISATION, NEW ACTORS AND THE CHANGING INFORMATION LANDSCAPE

The last few years have witnessed unprecedented data generation, often described in terms of a vast increase in the volume of digital data, known colloquially as “big data”, characterised by the four “V’s”: volume, velocity, veracity and variety. From satellite imagery to smart appliances, the way that we interact with the world, and with one another, is becoming increasingly governed by data. Aided by our smartphones we, ourselves, have become human data factories, pumping out torrents of information—from heart rates to browsing habits—twenty-four hours a day. The size and scope of this revolution can be gauged by the increase in the amount of online digital information and its manifold impact on our daily lives. Further, these new sources of information like social media, call detail records, sensors, and satellite imagery provide the opportunity to produce more and better data for development. This has also given space for new actors and players to enter and shape the data ecosystem. Different countries around the globe are witnessing and participating in this revolution at differing rates. (OECD, 2017)

Official statistics have performed an adequate job of supporting a credible public discourse for decades, if not centuries. To be used and be useful, they have been perceived as trustworthy truth-holders of the past.

However, official statistics are no longer the only lens available to understand the increasingly interconnected world around us. Rapid digitalization, emergence of new methods and big data have reimaged ways to capture our modern society with globalised issues and localised identities. These new approaches have no single standard of quality or accuracy and no rigid scales of analysis or classifications; they seize our fluid identities and moods in real-time to discover insightful patterns and trends – making them exciting and controversial just the same.

By contrast, official statistics might appear less relatable and highly abstracted from lived realities, threatening their long-term relevance and credibility. The legitimacy of statistical classifications and indicators like GDP and employment rates traditionally used to represent demographic, social and economic changes is slowly slipping away, especially for individual citizens at large.

This challenge is exacerbated by the contemporary populist attack on “experts” and “elites”, who are seen to have lost touch with ordinary people, coupled with disdain towards elected representatives and declining trust in public institutions. These trends have ushered in a new “post-truth” socio-political climate characterised by amplified disinformation and biases in our real and virtual echo chambers. (Davies, 2017)

2 UNDERSTANDING TRUST AND ITS DETERMINANTS

Trust is "a person's belief that another person or institution will act consistently with their expectations of positive behaviour"ⁱ

– The OECD Guidelines on Measuring Trust (OECD, 2017b)

2.1 WHAT IS TRUST? UNPACKING THE CONCEPT AND ITS COMPONENTS

Trust has been a subject of scholarly interest across time and disciplines, indicating a rich history in its literature. A quick search on Google Scholar for works containing "trust theory" and "trustworthiness" in the titles alone returns over 1300 and 4000 results, respectively, between 1980 and 2018. Some of the earlier conceptualisations are presented in the table below:

Definition	Author
"A generalised expectancy held by an individual that the word, promise, or statement of another individual can be relied on"	Rotter (1967)
"Confidence that one will find what is desired from another, rather than what is feared"	Deutsch (1973)
"A psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another"	Rousseau et al. (1998)
"The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party"	Mayer et al. (1995)
"A simple function, with the amount of trust varying as the result of some combination of characteristic similarity and positive relational experience, with broad societal norms and expectations setting a baseline or intercept – the initial expectations of general trustworthiness."	Creed and Miles (1996)
Trust = f(embedded predisposition to trust, characteristic similarity, experiences of reciprocity).	

Table 1: different notions of trust (adapted from OECD, 2017c)

It has also been extensively discussed in multiple fields, including political science (e.g. Rothstein and Uslaner, 2005), sociology (e.g. Delhey, Newton and Welzel, 2011), economics (e.g. Zak and Knack, 2001) and management (Costigan et al, 1998). Nannestad (2008) identifies a wide range of definitions by authors looking at generalised trust classifying it as a general outlook on human nature, an affective attitude, a relationship, a decision and an action, hence highlighting the breadth of the understanding of this concept. OECD (2017b)

i. The OECD Guidelines on Measuring Trust aim to assist data producers in collecting and reporting trust measures, and to support users of trust data in understanding different measurement approaches and their implications for analysis. They describe best practices in trust measurement, propose a core set of measures to form the basis for international comparisons, and encourage national statistical offices (NSOs) to include measures in their regular household surveys.

However some common themes emerge from the literature: for instance, Hardin (2004) notes that trust is “in the cognitive category with knowledge and belief”. Similarly, Morrone et al. (2009) note that expectations are central to most definitions of trust, and Uslaner (2008) identifies the central idea behind trust as a belief that most people share your moral values. Secondly, theoretical approaches to trust also identify that trust involves one person giving discretion to another party to affect the person’s interests. This introduces an inherent element of risk attached to trust. “Trust does not arise as an issue unless the person being trusted has the ability to affect the interests of the person doing the trusting materially or otherwise”. OECD (2017b) Accounting for the heterogeneous literature on the subject, OECD (2017b) defines trust as “a person’s belief that another person or institution will act consistently with their expectations of positive behaviour.” It focuses on beliefs or expectations about behaviour and notably, of positive (or good) behaviour.

Trust can be understood further with respect to the different relations in society, i.e. who is trusting whom or trust between different people, groups or institutions. OECD (2017b) provides a useful framework for organising a gamut of trust relationships, given below. For instance, ‘interpersonal trust’ refers to trust between different people (or residents), whereas trust between people and more abstract entities like government or public institutions is ‘institutional trust’.

By whom / On whom	Resident	Institution	Leaders
Resident	Interpersonal trust	Institutional trust	Political trust
Institutions	Civic trust	Inter-institutional trust	Political-administrative trust
Leaders	Political trust	Political-administrative trust	Multilateral trust

Table 2: trust between different parties (OECD, 2017b)

OECD (2018) accounts for three main channels that may influence trust: i) an individual’s characteristics, including her preferences, expectations and socioeconomic background; ii) the institutional environment the individual acts in; iii) and the societal and community context. This is presented in the below framework:

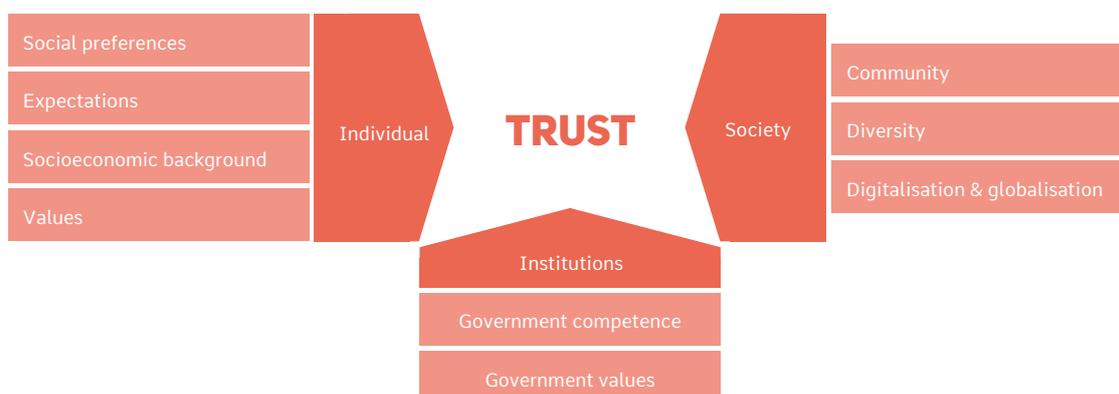


Figure 1: conceptual framework for determinants of trust OECD (2018)

For institutional trust, there are two further components of interest: “trust in competence” (i.e. whether the functioning of institutions matches people’s expectations about the competencies of those steering them) and “trust in values” (which captures whether institutions act in a way that is perceived by people as ethical and fair). Hence the two concepts are complementary to building and maintaining trust. Competence focuses on operational efficiency, capacity and good judgement to actually deliver on a given mandate whereas values drive the underlying intentions and principles that guide actions and behaviours. Within each component, relevant dimensions that are amenable to policy change are identified as: Responsiveness, Reliability, Integrity, Openness and Fairness. OECD (2017c)

2.2 TRUST IN OFFICIAL STATISTICS

Trust in official statistics is most often understood in terms of confidence in the outputs of the NSS, acting as a provider of statistical information. More specifically as a provider of credible, reliable and timely statistical information free of inappropriate political interference. However, trust in official statistics could also be relevant in other ways, e.g. the NSO as a trustworthy protector of the confidentiality of identifiable information. Many of these principles are encapsulated in the UN FPOSⁱⁱ. The UN General Assembly resolution recognises that “the essential trust of the public in the integrity of official statistical systems and confidence in statistics depend to a large extent on respect for the fundamental values and principles that are the basis of any society seeking to understand itself and respect the rights of its members, and in this context that professional independence and accountability of statistical agencies are crucial.”

OECD (2011) identifies three sets of factors underlying trust in official statistics:

- **Structural factors** including the extent to which the statistics are, or are perceived as being, objective and independent, impartial and non-partisan (i.e. not subject to political interference) and transparent (e.g., release dates are publicised in advance; clear explanations are given for changes or revisions);
- **Statistical factors** including complying with international standards and having sound methodological practices, robust statistical processes and quality outputs.
- **Reputational factors** which determine the public’s opinion of official statistics, including practices like publication of relevant data on important and topical policy issues, public consultation, effective stakeholder management (like with the media), correcting inaccurate data, among others.

Along with the above factors, it also acknowledged caveats, first: there may be no causal linkage between these factors and trust itself (for instance, while low levels of quality will very likely directly reduce trust in official statistics, high levels of quality may not necessarily reverse this, at least not in the short term); and second, the presence of externalities outside the statistical system. Accounting for all of this, the following model measurement framework was proposed for trust in official statistics:

ii. For instance, Principle 2 of the UN FPOS states: To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

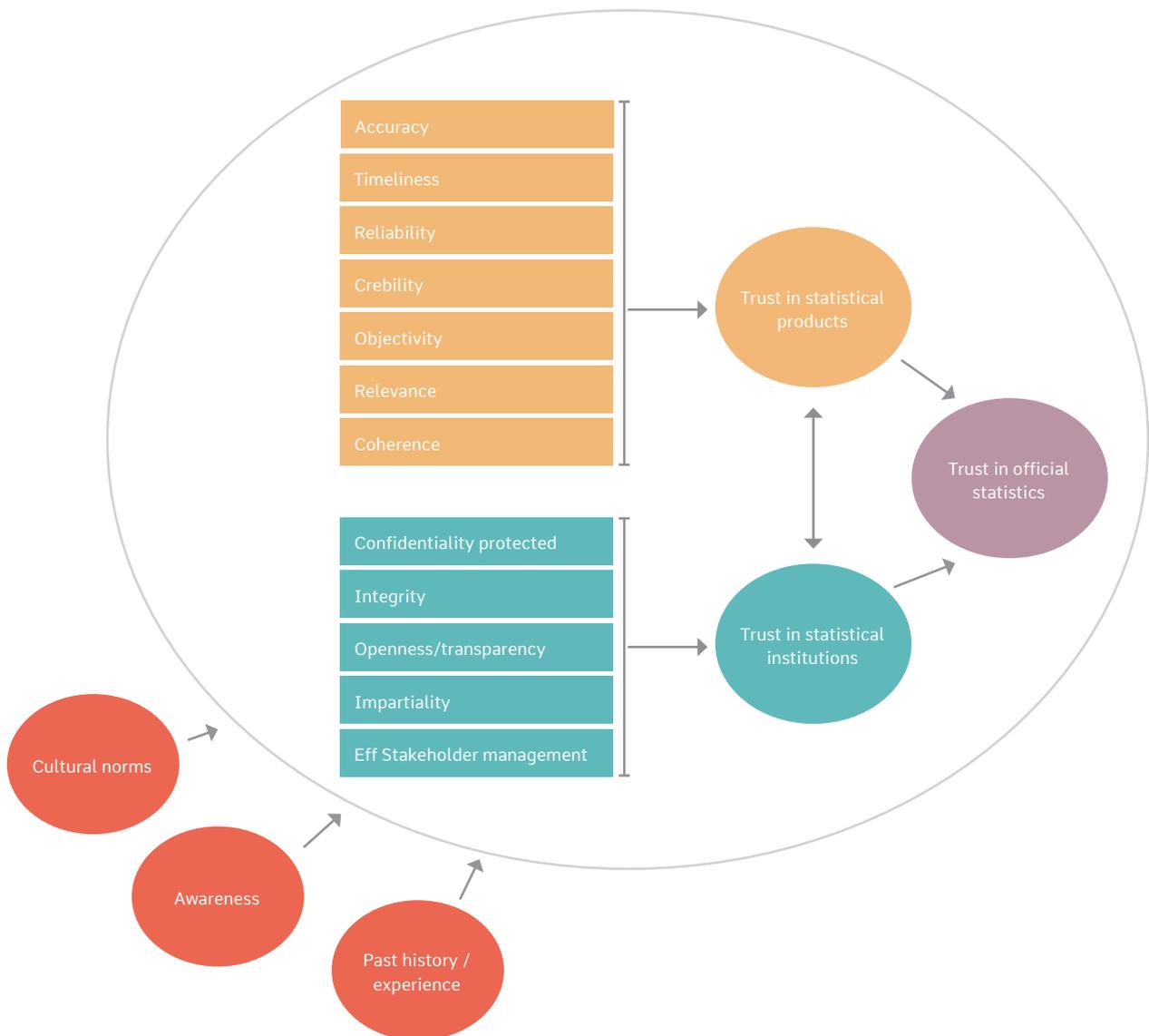


Figure 2: OECD framework for trust in official statistics, OECD (2011)

The above figure shows that trust in the official statistical system can be parsed as: trust in products (yellow portion) and the institution (blue portion). Each of those two components have further determinants, most of which are largely in control of/can be managed by the NSO directly. By contrast, the orange ovals denote the external factors and environment that official statisticians interact with. These include cultural norms (for e.g. the level of trust in a given country toward a variety of organisations); awareness and past experience.

3 TRUST AND NATIONAL STATISTICAL SYSTEMS

...confronted with data coming from private sources, produced in anonymity and secrecy, without a public scrutiny, Official Statistics will necessarily have to make their voice heard in post-truth controversies. They must inspire confidence, not suspicion. They must convince, not pressurise. They must aid, not enslave. They must emancipate, not subjugate. They must reveal, not mislead.

– Walter Radermacher, 2017

The UN Fundamental Principles of Official Statistics serve as a good indicator for what could constitute as a trustworthy statistical system. While those principles give a baseline guidance to NSSs on a global level, the challenge of building trust is multifaceted and requires a holistic attempt to strengthen statistical institutions and key stakeholders within and outside the NSS.

3.1 THE CHALLENGE: TRUST IN THE NEW DATA ECOSYSTEM

Trust is much easier and quicker to lose than gain. Recent events from even well-established statistical systems highlight the difficulty of restoring trust after a breach. Earlier this year, a survey in Japan found that nearly 80 percent of people lost trust in the government's economic indicators after years of faulty wage data marred by sampling errors were released. Erosion of trust was also reported due to the 2018 online census with relatively low response rate at Statistics New Zealand. Incidents from other NSSs also highlight the importance of trust-building and maintenance: analogous stories came out regarding poverty and GDP estimates from Rwanda, population numbers from Nigeria, GDP figures in India and employment statistics in the UK. Statistical neutrality and the independence of their producing agencies have always been under public scrutiny, such as in Argentina and, more recently, in Tanzania. Consequently, this has led to a two-fold challenge in the current digital age for NSSs: to enhance the integrity and relevance of official statistics for increased use by the layperson, but also repair the decline of public confidence in official numbers and expertise.

Along with a declining trust in public services, new players have entered the wider data ecosystem, directly or indirectly impacting the value of official statistics. Technology has enabled many actors who previously did not have the capabilities to embark in costly and resource-heavy data collection, analysis and dissemination techniques to produce evidence on various policy areas and provide innovative solutions for the management of public goods. This leads to a proliferation of alternative data swirling around in a shared data ecosystem. At the same time, some of those actors collaborate and build so called "data trusts", defined by the Open Data Institute as "a legal structure that provides independent stewardship of data." (Hardinges, J. and Wells, 2018) In many cases they do not have a clear purpose, nor transparent decision-making processes. For that reason, it is crucial that new actors engage in best practices to become trustworthy data stewards, and thus actors trustworthy enough to handle sensitive official data.

With different data being generated behind our backs, processed by techniques we don't fully comprehend, and bombarded onto us from actors with different interests, the official statistics community has a renewed importance in playing a critical role to bring credible, evidence-based information to the public. To do so, institutions like NSOs must go beyond their traditional data production remit to become a trusted, visible force for reason in people's lives by building trust, embracing relevance, and communicating proactively. This is especially important since data quality (a conventional focus for NSOs) is a necessary but not a sufficient condition to create and sustain trust in statistics. Other reputational and structural factors also matter greatly (OECD, 2011).

In this light, the challenges outlined above are inadvertently tied to strengthening statistical capacities in the NSSs, focusing as well on enhancing the data and statistical literacy among the user community. Not only do government institutions, and in particular the NSOs need to navigate and coordinate in a changing data ecosystem. In order to sustain trust in public statistics, NSOs need to keep up with technological change and adapt to innovative methodologies, build better production processes, engage in advocacy campaigns and acquire new skills.

3.2 THE CAPACITY TO BUILD AND SUSTAIN TRUST

Trust is a complex web of relationships in societal systems spanning beyond a single human's radius of perception and understanding. For official statistics, the challenge is by far more complicated – building trust requires strengthening the NSO (and NSS at large) in a changing data ecosystem. To simplify the task, we look at the NSS as a three-level system, encompassing the individual, the organisational and a systemic level – the enabling environment.ⁱⁱⁱ Building trust requires changes on all three levels, thus establishing capabilities within and across those levels.

At a system level, there is an urgent need for better coordination and stakeholder management inside and outside the NSS. NSOs need to cooperate more than before with other governmental organizations within the NSS, like the statistical departments of line-ministries or planning agencies, and outside the NSS, like with private actors and civil society. Codes of conduct and ethical motivated practices might support stakeholders to engage in transparent decision-making processes. Institutional settings should enable NSOs to engage in open user-producer dialogues and actively educate users to enhance data and statistical literacy across various group of stakeholders. System level adaptation might as well require adjusting the legal framework – making sure it complies to UN FPOS amongst others. Lastly, targeted advocacy strategies have proved successful in engaging with users, raising awareness and increasing the relevance of official statistics.

At an organisational level, NSOs have to instil trust in statistical products. Statistical production as such should follow transparent and accessible processes to promote openness and accountability throughout the wider statistical community and beyond. New models for the provision of public services explore co-production of data between the civil society, the private sector and the government as well as ways of using data already produced by other actors inside the NSS. When collaborating with private sector actors, NSOs might act as a guarantee of quality. Private sector agents have to ensure that consumers and other stakeholders (such as regulators)

iii. The individual level refers to a single human being within the NSS, for example a statistician, NSO employee or line manager. The organizational level refers to a social entity (such as the National Statistical Office or a line ministry) comprised of multiple interacting individuals that are coordinated through a hierarchy of authority and responsibility to achieve an explicit, common purpose (such as official statistical production). The system level refers to an organized, purposeful structure consisting of interrelated and interdependent individuals, organizations or stakeholders whose activities relate to official statistics at the national level.

fully understand the collection and use of consumer data. At the same time, strategic planning, coordination, monitoring and evaluation inside the NSO ensure accurate and reliable high-quality data. These activities as such are a juggling act, however it is crucial to recognize how they lay the basis for trust in official data – the NSO major product.

At an individual level, NSOs should aim at empowering and training people. As we have learned that interpersonal trust reflects on institutional trust, people are at the core of this process. Quantitative skills ensure objective and credible data production, analysis and dissemination processes. In addition, communication, negotiation and leadership skills gain importance in times where automatized data analysis becomes more common and users have difficulties in understanding where data comes from and whether it is reliable.

A complex task requires an answer capable to adapt to different country contexts and statistical systems. New approaches to capacity development might be one way to build trustworthy NSS. In 2016, PARIS21 introduced Capacity Development 4.0. 'Capacity Development 4.0' (CD4.0) is the process through which a country's national statistical system, its organisations and individuals obtain, strengthen and maintain their abilities to collect, produce, analyse and disseminate high quality data to meet users' needs (PARIS21, 2018) . CD4.0 envisions capacity development to leverage the crosscutting nature of data and statistics to become more interoperable, automatized, participatory and inclusive.

The rising importance of statistics on a global level and the need to have an independent body responsible for statistics in a democratic society has also strongly influenced the willingness of countries to engage in scaling up their support and domestic resources in developing statistical capacity. This has gained further urgency in view of the global development data demands brought out by Agenda 2030 and the Sustainable Development Goals' monitoring framework, with the imperative to 'leave no one behind'. The UN Statistical Commission also called on Member States to become more vocal and leading in the process of global statistical systems and thus empowered NSOs in taking measures to improve the NSSs . Both the stronger emphasis on partnership and rising awareness has led to an increased focus on country ownership – a requirement indispensable for building trust.

With the increased advocacy and ownership among recipients, a stronger focus on establishing sustainable processes, methodologies and tools has emerged. Countries and donors alike not only support technical aspects of data collection and data production, such as surveys, data analysis and data management, but invest more effort and time in facilitating the development of reusable procedures and permanent structures. It remained important to produce good statistical outcomes. However, stakeholders now consider a project that leads to the instalment of infrastructures and procedures strengthening the whole system more successful.

Trust and statistical capacity development are closely related. Challenges of trust arise due to a changing data ecosystem. New approaches in capacity development aim at strengthening NSSs in their ability to face those challenges. Similar to trust, capacity development requires a holistic perspective on the data ecosystem, its key stakeholders and in particular its users. CD4.0 might be one way of leveraging the opportunities a modern data ecosystem offers while guiding NSS in their provision of independent, transparent and statistical sound processes, their efforts to coordinate with data behemoths and, most importantly, their interaction with data users.

4 THE WAY FORWARD

Trusted smart statistics are the future of official statistics

– Ricciato et al, 2018

4.1 TRUST AND THE FUTURE OF OFFICIAL STATISTICS

The data ecosystem changes drastically, and change is likely to continue to accelerate. New technologies already shift the focus from how to analyse data to what to analyse. A variety of different data actors with varying expertise already enable highly-specialized data collection, production and dissemination of data on a global level. These developments bear huge potential if NSSs manage to keep up with the challenge of building and sustaining trust.

The traditional strengths of NSOs include, on the one hand, the ability to collect data and combine secondary data sources with statistical products and, on the other hand, their focus on quality, transparency and sound methodology. In today's era of competing and multiplying data sources, they continue to have a unique knowledge of official statistical production methods. Further, their impartiality and respect for privacy as enshrined in law uniquely position them as a trusted third party. Based on this, they may advise on the quality and validity of information of various sources and actors. By thus positioning themselves, they will be able to play their role as leading information providers and certifiers in a changing society. (Struijs et al., 2014)

There are emerging solutions holding promises to address trust challenges in this space with the assistance of technology. Blockchain is one such example. Distributing trust horizontally - which is what blockchain enables – instead of single third party top-down mediation, is gaining traction. However, it is too early to argue that a technology led solution will be enough to remove the need for human intervention in the trust system all together anytime soon.

Ricciato et al. (2018) argue “Trusted Smart Statistics” as the natural evolution of official statistics in the new datafied world, where traditional data sources (survey and administrative data) represent a valuable but small portion of the global data stock, much thereof being held in the private sector. This requires a new reference architecture to build “trust” amongst all stakeholders i.e., a coherent system of technical, organisational and legal means combined to provide an articulated set of trust guarantees to all involved players.

In the age of big data, artificial intelligence and algorithms a renewed need for ethical governance and legal frameworks has emerged on all fronts. The over-two hundred year old rich history of statistics provides a ripe stock of such ethical and governance principles – for example the Declaration of Professional Ethics, that the community of statisticians have agreed upon and that states “Shared Professional Values and a set of Ethical Principles that derive from these values” (ISI, 2010) or different national or international Codes of Conducts developed for statistical institutes and authorities (like the UN FPOS). According to Radermacher (2017), the future role of official statistics in the emerging future data-information-knowledge landscape will be determined by triangular set of factors including: techniques (problems of methods and tools), ethics (problems of behaviours) and politics (problems of institutional set up or communication).

4.2 WHAT DOES THIS MEAN FOR NATIONAL STATISTICAL SYSTEMS (NSS)?

Building on existing achievements in the field of trust and statistics, we invite NSSs to reflect on some of the following key actions – all of which require strong statistical, coordination and innovation capacities, as a run up to the 2019 PARIS21 Cross Regional Forum:

- **Conduct regular trust assessments:** NSS should engage in regular trust assessment activities to assess temporal changes in perception and identify potential reasons. As recommended by the OECD Trust Guidelines on Measuring Trust (OECD, 2017b), NSOs might be advised to regularly collect data on trust as well as reflecting on drivers of trust and strategies to maintain public trust in institutions.
- **Maintain strong relationship with data users:** For official statistics to be relevant and used, they have to fill a gap in users' needs. Involving the users in the selection of the relevant statistics to be produced helps in evaluating the use of information and reflecting on setting priorities in the direction of the development of the statistical system.
- **Conduct targeted advocacy strategies:** Depending on the political, economic and social situation, advocacy strategies might differ. An advocacy strategy might reinforce public confidence in the NSS (independence, transparency) and in the use of statistics. Moreover, it helps raising awareness on the relevance of quality statistics for development.
- **Assess and maintain the quality of (co-)production:** Quality frameworks deliver principles and standards to assess the quality of the output of statistical production. Beyond purely assessing output quality, it is important to emphasise the need for total quality management encompassing strategic planning, monitoring and evaluation of capacity related and thus trust-related activities.

Digital technologies and approaches coupled with commercially collected big data have ushered in a new "post-truth" era characterised by amplified disinformation that affects public discourse. Most of us are oblivious to the workings of the underlying raw data, processing techniques and mechanisms. With different numbers being constantly generated beyond our knowledge, institutions like NSOs must go beyond their traditional data production remit to become a trusted, visible force for reason in people's lives by building trust, embracing relevance, and communicating better. (Fu, 2018)

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